AGRICULTURAL NEWS LETTER

VOL. 15 - NO. 4 JULY - AUGUST, 1945

This publication contains information regarding new developments of interest to agriculture based on laboratory and field investigations by the Du Pont Company. It also contains published reports of investigators at agricultural experiment stations and other institutions as related to the Company's products and other subjects of agricultural interest.

DU PONT

REG. U.S. PAT. OFF.

ISSUED BY PUBLIC RELATIONS DEPARTMENT, E. I. DU PONT DE NEMOURS & CO. (INC.), WILMINGTON 98, DEL.

Vol. 16 - No. 4 July-August, 1948

AGRICULTURAL NEWS LETTER

Published by the Extension Division
Public Relations Department
E. I. du Pont de Nemours & Company (Inc.)

L. F. Livingston, Manager

Gus M. Oehm,
Agricultural Editor,
Wilmington 98, Delaware

M. H. Bruner, Extension Division, Du Pont Co., Clemson, S. C.

V. S. Peterson, Extension Division, Du Pont Co., Ames, Iowa

CONTENTS

CRAWFORD H. GREENEWALT, DU PONT PRESIDENT, REVEALS ONE GUIDING PRINCIPLE COMMON TO ALL SCIENTIFIC RESEARCHES

"I have spent the greater part of my working life in scientific endeavors and I have learned by hard experience one guiding principle common to all scientific researches -- never to discard the results of a well-demonstrated experiment in favor of an hypothesis that denies those results.

"That principle is no less valid in economic and political than in scientific fields. We in the United States launched, some 160 years ago, an experiment in government and economics. While the results have not been perfect, it is nonetheless true that the experiment, by any test that could be applied, has turned out successfully -- so successfully that it has never been matched in the long sweep of history in giving such great benefits to such a multitude of people.

"Set off against this experiment, we see theories which maintain that our system holds out no hope for humanity, that the only chance for the world -- for the United States itself -- is to turn to increasing control and domination by government.....Even if these concepts were only theoretical, we should not be justified in allowing them to persuade us to discard the successful results of our experiment."-- Excerpt from address of Crawford H. Greenewalt, president of the Du Pont Company, at the annual banquet of the U. S. Chamber of Commerce.

DU PONT PRESIDENT SAYS PRINCIPAL THING AMERICANS HAVE TO OFFER WORLD IS OUR BELIEF IN MAN'S INHERENT DIGNITY

Free individual incentive is America's greatest national resource, Crawford H. Greenewalt, president of the Du Pont Company, said recently in a speech at the annual dinner of the United States Chamber of Commerce in Washington, D. C.

"Only because we were free and only because we let man's incentive have full rein," has the United States become the most powerful nation on earth, he said.

"How, then, can we afford today," he asked, "to permit any infringement of that incentive? To permit such infringement is not liberalism, but its exact opposite. To prevent such infringement is the true liberalism, to which we must adhere."

Making his first address since his election this year as head of the Du Pont firm, Mr. Greenewalt, a chemical engineer, said that the principal thing Americans have to offer the world "is our faith - our fundamental belief in man's freedom of opportunity - our belief in his inherent dignity - that the world is peopled by individuals and not by governments."

Rehabilitation of Faith More Important Than of Property

"I am sure," he said, "that the rehabilitation of faith is more important than the rehabilitation of property. The material aid we may extend to Europe will avail little by itself. The essence of the European problem is not physical, or material, but one of recreating faith in the ability of the incentive economy to function."

He called for reaffirmation of "the strength, validity, and eternal vigor" of the principles of the American system, asserting that those principles "are this country's greatest potential export to a disillusioned world."

Controlled Economy Inevitably Brings Chaos and Collapse

Wherever the controlled economy has been tried, he said, "the inevitable result has been decline and despair, chaos and collapse, sometimes preceded by war, sometimes not."

"In the face of this record of constant failure on one hand, and of success beyond the most optimistic dreams on the other," he said, "it seems to me the sheerest madness for any American to allow himself to surrender any part of the faith that has made our experiment successful."

The Du Pont chief expressed the fear that "we have already descended a few rungs on our ladder of freedom."

Continued on next page

"We have accepted government controls of many sorts," he said. "We have accepted a crushing burden of taxation, and we have bartered away some of our freedom as citizens in return for questionable doctrines.

"There is involved here a delicate balance. It is manifestly not possible for everyone to have absolute and unlimited freedom. Each of us has agreed, for the common good, to surrender some part of his individual sovereignty to government, so that no individual shall infringe upon or curtail the freedom of others.

"This is as it should be, for we have not reached that millenium under which no such controls would be necessary. At the same time, I think we must insist that those controls be held to the minimum consistent with the maintenance of our democratic principles, and that the government enforce them as an impartial umpire, for the good of the entire country."

Mr. Greenewalt called for "industrial statesmanship of the highest order," and urged business leaders to see to it that people understand how the American economy works.

"That statesmanship, to succeed, must be objective, unselfish, and keyed to the nation's good. This is fundamental, but this alone is not enough. Our industrial leaders must take an active part in explaining and defending our economy so that it will be understood by the people. They must be articulate in behalf of the things they stand for."

Good Deeds Speak for Themselves Only If Public Knows About Them

"It would be a fine thing if good deeds spoke for themselves but they can do so only if the public knows about them," Mr. Greenewalt said. "It is high time that the American people are informed of what is right about their system as well as what is wrong with it.

"We must make it clear that our industrial economy is a partnership for the benefit of every citizen; that it brings us goods and services in great profusion; that it brings prosperity and happiness to our workers; and that it recognizes the rights of property and the merits of thrift by offering a return to those who, having saved, are willing to risk their savings in venture capital to provide the tools for our national production."

NOTE: Printed copy of Mr. Greenewalt's speech before the U. S. Chamber of Commerce will be sent upon request. Address, Editor, Du Pont "Agricultural News Letter," Wilmington 98, Del.

########

Agricultural News Letter (Du Pont)
Vol. 16 No. 4 July-August, 1948

NEW F 531 TURF FUNGICIDE CONTROLS DOLLARSPOT

The Du Pont Company is introducing a new fungicide that can help give golfers greener, smoother, and healthier greens on which to play. This new chemical product -- Du Pont's F 531 fungicide -- controls dollarspot, the turf disease that causes bleached spots of dead grass about the size of a silver dollar. It can also be used on grass tennis courts and high-grade lawns.

Du Pont's F 531 Fungicide, a chromate complex of calcium, zinc, copper, and cadmium, also controls copper spot and pink patch, two lesser diseases that sometimes appear in turf areas.

The new turf fungicide is an undiluted, green-colored, soluble powder that, mixed with water, is easy to apply as a spray. It does not stain, does not corrode the metal in spray equipment, has no odor, and does not harm the grass to which it is applied when used according to directions.

F 531 Fungicide is being added to Du Pont's list of turf fungicides, which include "Tersan," a tetramethyl thiuramdisulfide product, and Special "Semesan," frequently used by those who prefer a mercurial formulation. Either of these established materials, properly used, prevents brownpatch and snow mold, two other important turf diseases.

Thus, use of F 531 Fungicide, at intervals throughout the season, along with one of the other two fungicides in a recommended schedule, will enable greenskeepers to take measures to prevent all of the important turf diseases.

Dollarspot Can Destroy Large Areas of Turf

The dollarspot disease may develop overnight, and can destroy large areas of turf both early and late in the season. Brownpatch discolors larger individual patches, and snow mold covers large circular patches with dirty white and pinkish turf.

Du Pont plant pathologists point out that preventive action with F 531 to control dollarspot, copper spot, and pink patch, and with one of the other two turf fungicides to control brownpatch and snow mold, is the best way to eliminate these diseases. Where infection appears, the materials can be used as a curative rather than a preventive when applied according to directions on the labels, but preventive action is preferred.

########

SCIENTIFIC RESEARCH LEADS TO IMPROVED LIVING STANDARDS

Scientific research has become a major American industry whose ultimate product is a high standard of living, Dr. Cole Coolidge, assistant director of the Chemical Department of the Du Pont Company, told a dinner meeting celebrating the 30th anniversary of the Delaware Section of the American Chemical Society in Wilmington.

U. S. Industry Leads In Application of Science

"American industry leads the world in the application of science to the improvement of living standards," he said. "Few industries have a growth curve comparable to that of industrial research during the last quarter of a century. In fact, scientific research has become one of America's major industries."

More Passenger Cars In St. Louis Than In All Russia

"Every time a new, a better, or a cheaper product emerges from the laboratory -- in Delaware or in some other state -- the standard of living is raised," Dr. Coolidge said. "It is the men and women in the laboratories, in the plants, in the offices, and in the universities who, as a team, have made this possible.

"Speaking on the American standard of living, Henry Ford II recently pointed out that there are not in all Russia as many passenger automobiles as in the city of St. Louis."

Research Is Main Reconnaisance Staff of Industry

"Research is now referred to as the main reconnaisance staff of industry," Dr. Coolidge continued. "It must keep years ahead of the forces of production so that these forces will always be directed and pushed toward a still higher standard of living."

Agricultural News Letter (Du Pont)
Vol. 16 No. 4 July-August, 1948

DU PONT BEGINS $30,000,000 EXPANSION OF RESEARCH FACILITIES

Construction work on a $30,000,000 expansion of research facilities at the Du Pont Company's Experimental Station at Wilmington, Delaware, has been started.

This is the biggest single laboratory project the company has ever undertaken. It will make the Wilmington Experimental Station, birthplace of nylon, neoprene, and other useful products, one of the largest research establishments in the world.

Some of the company's research organizations now located elsewhere will transfer to the new facilities. The ones already at the station are laboratories of the Chemical, Engineering, Grasselli, and Ammonia Departments, the nylon laboratory, and the Haskell Toxicological Laboratory. They will be joined by the Rayon Pioneering Laboratory, by research personnel of the Plastics and Pigments Departments, and by additional Grasselli Department research activities. The number of chemists and other technologists at the station will be almost doubled when construction is completed.

This major addition to scientific facilities will be an important factor in a program to increase Du Pont's activities in fundamental, long-range research as well as research directed toward the development of new chemical products and processes.

Greenewalt Gives Reasons for Expanding Research Facilities

"We are making this expansion in the belief that in coming years research will play an ever-increasing role in the development of products needed for the high standard of living we in America have come to expect," Crawford H. Greenewalt, Du Pont president, said. "The replacement of old products and processes by new ones underscores the importance of research. If scientific investigation remains unfettered, as at present, we can rely on the laboratories of free American institutions to give us new products in a never-ending stream. Our new facilities are required to keep abreast of the keen competition in the chemical field. They are needed for the experimental programs we now have underway, and are essential for those planned for the future. I know that they will contribute to the productive strength of the nation."

"Research has become an increasingly major phase of our operations in recent years," he said. "We have lately been enlarging our activities directed to the development of wholly new products and processes. We have also enlarged our program of fundamental research which has for its object the discovery of new scientific facts without regard to immediate commercial use. These developments have in turn made necessary the expansion of physical facilities now being undertaken."

Continued on next page

Construction Plans Call for Many New Buildings

Construction plans call for ten new laboratory and semi-works buildings for long-range research and development of new chemical discoveries. Existing laboratory buildings for nylon and other products will be enlarged. There are also to be thirteen new service buildings.

"We confidently expect to create many new jobs through this program of expansion," Mr. Greenewalt said. "I say this with assurance, because 20,000 Du Pont employees today are engaged in the manufacture and sale of products which either did not exist or were not produced commercially in 1936. These products provide jobs for many more thousands of people in the other businesses which use and sell them."

When the expansion is completed, the company expects to have 900 technical employees engaged exclusively in research work at the station, of which about 200 will be transferred from other laboratory locations. Now there are approximately 500 at the station. The total of all employees there, technical and non-technical, will approximate 2,500.

To Be Completed In About Two and A Half Years

Major part of the plan for the expanded Wilmington station calls for construction of an entirely new section on 55 acres of the Du Pont Country Club, which is adjacent to the station. The entire job, including work on new and existing buildings as well as outside work, is to be finished in approximately two and one-half years.

The Chemical Department, which is devoted exclusively to research, will use its new facilities primarily for fundamental research with the object of discovering new scientific facts without regard to immediate commercial use. Fundamental investigations have become one of the most valuable phases of Du Pont research work in laying the foundation for new lines of applied research. In the past, it has led to nylon, among other things. Some of the new facilities for other departments will also be devoted to long-range investigations.

The Engineering Department, in its new facilities, will explore advanced engineering problems to develop basic data on manufacturing and control equipment and construction materials.

Many of the new facilities will be used by manufacturing departments for applied as well as long-range research. The applied research programs of the manufacturing departments will include further investigations of nylon, rayon and other fibers and films and the development of new materials in these categories; work aimed at major developments in pigments and related products; investigations for long-range developments of plastics; expansion of long-range research on new products and processes for agricultural and industrial chemicals, and development of products of high-pressure synthesis.

########

NEOPRENE NIPPLE SIMULATES NATURAL FEEDING OF CALVES

Many dairymen prefer nipple feeding to open-pail feeding of their calves. Dairy experts approve of the new neoprene-nipple feeding device, described below, because it successfully simulates the natural method of feeding, and because it is easily cleaned.

They say it helps prevent scours, which may result from the use of ordinary hard-to-clean and therefore unsanitary nipples; its natural flow avoids the difficulties that often arise from the gulping of milk through a poorly constructed nipple or from an open pail.

A new, easy-to-clean, thoroughly tested, sanitary nipple, with special built-in action to keep calf-food compounds in suspension, is now being made of long-lasting neoprene, the Du Pont-made rubber.

The device consists of a hinged steel bracket, fastened to the side of the pen, a tough neoprene nipple with a molded shoulder, and a rugged plug attached to a black neoprene tube. This tube fits snugly into the open end of the nipple and extends into the pail below. The pail hangs on a hook behind the nipple, while its edge fits into a flange below. The sucking action of the calf rocks the pail just enough to keep calf foods in suspension.

Easy To Rinse In Cold Water

The molded inside surface of the tube and of the nipple makes rinsing in cold water easy.

The Mutual Products Company, 509 North 4th St., Minneapolis, developer and manufacturer of this simplified, no-valve nipple feeder, called "Natur-Nipple," emphasizes the simplicity of the design. A child can take it apart and put it together again.

########

Agricultural News Letter (Du Pont)
Vol. 16 No. 4 July-August, 1948

"ARASAN" ORDINARILY USED AS SEED DISINFECTANT, CONTROLS BLACKROOT OF SUGAR BEETS WHEN APPLIED TO SOIL IN FERTILIZER OR SINGLY ALONG ROW

"Blackroot of sugar beets is caused by a group of fungi that attack the lower stems of beet seedlings. It is found in almost every area where sugar beets are grown. Believed to have been intensified by some disturbance in the age-old rotation of plant life, the fungi do their worst in intensely cultivated areas and in warm, humid climates. Attempts at sterilizing the soil and at developing resistant seed have proved futile.

"Research men have been handicapped because of the myriad forms in which the fungi attack the plants. Blackroot infection of fields may spring from any one, or any combination, of the fungi, and the potency of the infection is never the same on any two occasions."--R.J. Doyle in "Sugar," November, 1947.

A chemical ordinarily used as a seed disinfectant for peanuts and vegetables is now being successfully applied to the soil to control blackroot, an important rot disease that frequently attacks the sugar-beet crop in both Canada and the United States.

This new procedure calls for application to the soil, before planting, of the material known to chemists as tetramethyl thiuramdisulfide, a fungicide produced by Du Pont and sold under the name of "Arasan" seed disinfectant.

"Arasan" seed treatment alone is inadequate for the control of blackroot. However, when applied to the soil at the rate of 3 pounds per acre in fertilizer or separately in single bands along the beet rows, this chemical wards off the disease through the germination and early growing stages, when the heaviest crop losses are usually sustained.

New Process Developed in Canada

The new process was developed in Canada through the cooperative efforts of scientists of the Plant Pathological Laboratory at Harrow, Ontario; the Canada & Dominion Sugar Company, Montreal; and Canadian Industries, Ltd., Montreal; and later of representatives of the tobacco and tomato industries.

In 1945, when some 645 acres of Ontario beets, worth around $90,000, were destroyed by blackroot, laboratory tests conducted by L. W. Koch and A. A. Hildebrand at Harrow, with "Arasan" as a seed disinfectant, were undertaken. They were almost complete failures. Then treatment of the soil

Continued on next page

itself was undertaken. Hundreds of tests were started. At first, 150 pounds of "Arasan" were applied per acre. The blackroot was entirely eliminated -- and so were the beets.

Then reduced amounts -- 100, 75, 50, and 25 pounds -- were applied with similar results. With treatments of 20, 15, and 10 pounds, a few healthy plants survived. Finally, with an application of only 3 pounds of "Arasan" per acre, the disease was practically eliminated, and the beets were hardy and fast-growing.

The Canada & Dominion Sugar Company then granted a $3,000 scholarship to a 24-year-old farm boy, Wilbert McKeen, who had just received his master's degree in plant pathology from the University of Western Ontario. McKeen succeeded in isolating "water mould", the elusive fungus that attacks seedlings in warm, humid weather and after heavy rains.

In 1946, despite torrential rains in June in the area where tests were underway on a number of farms, stands of beets in treated fields were three-and-a-half times better than those in non-treated fields after the water-mould danger period had passed. Thereafter, McKeen and the other cooperating scientists began recommending use of the fungicide as a soil treatment.

Results Over Entire Area Outstanding In 1947

R. J. Doyle of the Canada & Dominion Sugar Company, Ltd., says results over the entire area in 1947 were outstanding. He adds:

"While blackroot destroyed entire fields of beets in untreated soils during the late, wet spring of 1947, not a single field of 'Arasan'-treated beets had to be plowed under and replanted. This new crop insurance cost farmers only $3.50 an acre. No expensive equipment is required to apply it; a few minutes' work with two flexible tubes, a tin can, and welding torch results in adapting a tractor drill to handle the fungicidal fertilizer. Now, tomato, melon, and cucumber growers have become interested in the results obtained, and have launched experiments with their crops. And, again the soil treatment process is proving effective in controlling rot of seedlings."

Mr. Doyle says reports of the experiments are being studied in the United States, and a number of tests plots were planted in the spring of 1948. The Michigan Sugar Company already has had considerable success with its experiments, and is using "Arasan" on a commercial basis in 1948.

"We have, in truth, only begun to probe the possibilities of soil treatment," reports Homer Fletcher, chief of the Canada and Dominion research department, who made the first field experiments.

Mr. McKeen started a new series of tests at Harrow, and continued them during the past winter at the University of Toronto, where he has been observing the effects of penicillin and streptomycin on the fungi that attack the beet root.

########

Agricultural News Letter (Du Pont)
Vol. 16 No. 4 July-August, 1948

CRYSTAL UREA, ACTIVE INGREDIENT IN "TWO-SIXTY-TWO" FEED COMPOUND, MADE BY COMBINING AMMONIA WITH CARBON DIOXIDE

The development of a commercially feasible process for the manufacture of the chemical compound carbamide -- commonly called urea -- which involves the reaction between anhydrous liquid ammonia and carbon dioxide, was a major chemical engineering feat. To get these two materials to combine properly, they must be subjected to several thousand pounds of pressure in equipment that will withstand very high temperatures -- hundreds of degrees. Such a process was perfected by Du Pont chemists and engineers only after years of research, bringing together the combined skill and experience of highly specialized chemists and engineers, and the investment of millions of dollars for equipment.

Exhaustive research at many agricultural experiment stations has proved that this synthetic nitrogen compound -- urea -- can be used to supply a portion of the protein in rations of cattle, sheep, goats, and other ruminants. However, since the crystals of synthetic urea absorb moisture readily and tend to cake and harden on drying, conditioning is required to make the material suitable for blending in balanced proprietary feed mixtures. The crystal urea is therefore specially formulated by Du Pont with certain other materials to produce "Two-Sixty-Two" feed compound -- a product satisfactory for use by feed manufacturers and mixers. Making "Two-Sixty-Two" is complicated and involved, requiring the constant supervision of skilled workers to maintain a high standard of quality.

Determining Protein Value of Feedstuffs

"Two-Sixty-Two" contains 42 per cent urea nitrogen that can be used by ruminants. In determining the protein value of any feedstuff, natural or chemical, the quantity of nitrogen in the material is multiplied by 6.25. Thus, 42 times 6.25 gives an equivalent protein value of 262 per cent. Hence the name "Two-Sixty-Two." Stated simply, 1 pound of "Two-Sixty-Two" is equivalent to 2.62 pounds of protein.

In feeding urea to ruminants, normal animal-nutrition principles do not apply. Actually, the nitrogen feeds the bacteria in the rumen and these are in turn utilized in subsequent digestive processes. The bacteria convert the urea nitrogen into the complex proteins required by the animal.

########

Agricultural News Letter (Du Pont)
Vol. 16 No. 4 July-August, 1948

UREA IN PELLETED FEED FOUND SATISFACTORY IN RATION OF BEEF CATTLE

Small pellets of feed containing urea as an extender of protein in the rations of beef cattle have given satisfactory results in a series of digestion trials and feeding experiments at the Oklahoma Agricultural Experiment Station.

In the tests, conducted by H. M. Briggs, W. D. Gallup, A. E. Darlow, D. F. Stephens, and C. Kinney, different quantities of urea were included in the pellets, either in the form of crystal urea containing 46.6 per cent nitrogen or Du Pont's "Two-Sixty-Two" feed compound containing 42 per cent nitrogen. The pellets also contained 10 per cent blackstrap molasses, and varying amounts of hominy and cottonseed meal.

A report by the Oklahoma research workers, published in the November, 1947, "Journal of Animal Science," Vol. 6, No. 4, gives a brief review of the literature covering previous experiments in which urea was included, for the most part, in commercial-type bagged feeds for ruminants. In these earlier studies, urea was found to be quite generally satisfactory when not more than one-third of the total protein requirement was supplied by the urea.

Because of the shortage of protein concentrates and with the recent introduction of the practice of pelleting cottonseed meal and other concentrates, the Oklahoma scientists decided to find out if -- and how much -- urea could be included in the pelleted types of feed for beef cattle.

Summary of Oklahoma Results

These supplements in which approximately 25 per cent, 50 per cent, and 75 per cent, and nearly 100 per cent of the supplemental nitrogen has been furnished by urea, were fed with a basal ration of low-grade prairie hay to yearling and two-year-old steers in metabolism stalls. When fed under such conditions, the pellets which contained up to 50 per cent of their total supply of nitrogen as urea and the remainder largely as cottonseed meal, were similar to straight cottonseed meal in promoting nitrogen storage by the animals.

Pellets containing approximately 25 per cent of their nitrogen as urea proved an entirely satisfactory source of supplemental protein in two dry-lot studies with fattening calves. Pellets containing 50 per cent of their nitrogen as urea served as a satisfactory supplement in the early phases of a fattening period.

Continued on next page

In two range feeding trials, pellets containing approximately 25 per cent of their nitrogen as urea gave as good results as cottonseed meal when fed to yearling heifers on the range. In a single test for wintering heavy steers under range conditions, the average daily gain was slightly less than with cottonseed meal.

No results indicating toxic effects of urea were obtained in these studies, although the urea-containing pellets were full fed as a source of protein at relatively high levels.

NOTE: A reprint of the Oklahoma report will be sent on request. Address Editor, Du Pont "Agricultural News Letter," Wilmington 98, Del.

########

U.S.D.A. OFFERS AID IN COUNTY LIVESTOCK PEST-CONTROL PROGRAMS

The United States Department of Agriculture has offered to aid county agricultural agents and other farm specialists in their current efforts to provide farmers and ranchers with information and leadership in countywide programs for the control of livestock pests.

Urgent need for these programs is pointed through release of a new Farm Fact sheet, "Save Grain by Controlling Livestock Pests." Prepared from material supplied by the Bureau of Entomology and Plant Quarantine, it says "the brunt of an estimated annual half-billion dollar loss caused by external livestock pests falls on farmers and ranchers in wasted feed, reduced meat and milk production, and damaged hides."

Copies of the Farm Fact Sheet can be obtained from the Office for Food and Feed Conservation, U.S.D.A., Washington 25, D. C.

########

Agricultural News Letter (Du Pont)
Vol. 16 No. 4 July-August, 1948

ORGANIC DISINFECTANT TO TREAT SWEET POTATOES AND ONIONS

"Tersan" non-mercurial fungicide, used chiefly to prevent large brown-patch and dollarspot of golf greens, grass tennis courts, lawns, and other fine turfs, has also given good control of stem-rot and scurf of sweet potatoes, and of damping-off and smut of onions.

Of course, because of its long years of successful use for the control of certain diseases of both sweet and Irish potatoes, "Semesan Bel" seed disinfectant is Du Pont's standard material for this purpose.

Recently, however, as a result of experiments at a number of state agricultural experiment stations, including New York, New Jersey, Indiana, Illinois, and Massachusetts, "Tersan," the comparatively new organic fungicide formerly called "Thiosan," is being recommended as a sprout treatment for sweet potatoes, and in certain areas as a disinfectant for bulb-onion seed.

Dr. R. H. Daines of the New Jersey Experiment Station recently reported that, on the basis of his tests covering several years, "Tersan" and "Semesan Bel" are "the two important materials to use to control both scurf and stem-rot, the two most commonly occuring field diseases affecting sweet potatoes in New Jersey."

When "Semesan Bel" is used for Irish potatoes, the seed pieces are dipped in the solution; however, when either "Semesan Bel" or "Tersan" is used for sweet potatoes, the sprouts are removed from the seed potatoes and bunched together for easy handling. The lower and injured ends of the detached sprouts are simply dipped by hand for about half a minute, and planted promptly after treating.

"Tersan", with Sticker, and "Arasan" Dust for Onion Smut Control

In another phase of plant-disease control, "Arasan" seed disinfectant and "Tersan" are rapidly displacing the use of formaldehyde for the control of damping-off and smut of onions. These products were first tested for onion smut control by Dr. A. G. Newhall at the New York (Cornell) Experiment Station.

Since some investigators recommend either or both "Tersan" and "Arasan," each of which contains tetramethylthiuram disulfide as the active ingredient, for use on the bulb-onion seed, and since "Arasan" is specified by most stations for application to the onion-set dry seed, Du Pont plant pathologists suggest that growers follow the recommendations of the Experiment Station and Extension Service in their home state.

Continued on next page

Where the state plant pathologists recommend "Tersan" for bulb onions, the seed is moistened with a methyl cellulose sticker to hold the chemical to the seed. The chemically coated or pelleted seed give especially good protection where the soil is heavily infested with smut. Where "Arasan" is used, it is applied as a dust.

Smut Organism Increases Rapidly In Soil

Dr. Oran C. Boyd, Extension plant pathologist at Massachusetts State College, states that "when introduced into the soil, the smut organism increases rapidly with successive crops of onion, particularly when seed onions or seed-sets are grown. Furthermore, the smut organism is able to survive in the land for several years even in the absence of an onion crop. The fungi that cause damping-off in onions and other crops are present in the soils of all gardens and fields. Damage to onions from either smut or damping-off consists primarily of a thin, irregular stand of seedlings. In the case of a field of seed onions, this type of injury results in reduced yield, while in a crop sown for set production, it results both in a low yield of desirable size sets and in the production of many oversize onion sets or 'picklers.'"

Illinois Pathologist Summarizes His Recommendations for Control

The Du Pont Company emphasizes the importance of growers obtaining full information from their state authorities. For example, Dr. M. B. Linn of the Illinois Extension Service, in a mimeographed statement, "Control of Smut and Damping-Off with Dust Seed Treatments - 1946", summarizes his recommendations as follows:

"ONION-SET SEED. Use "Arasan" (1 pound to 10 pounds of seed) on dry seed.

"BULB-ONION SEED. Use "Tersan" (1 pound to 1 pound of seed) on seed which has been moistened previously with Methocel sticker (5 per cent) at the rate of 1 pint to 4 pounds of seed, or

"Use "Arasan" (1 pound to 4 pounds of seed) on dry seed, pouring excess dust into seeder with seed."

NOTE: For additional information, including instructions on the best way to make and apply the sticker to bulb-onion seed, write the Retail Products Division, Du Pont Company, Wilmington 98, Delaware

########

MORE THAN 200 DIFFERENT SUBSTANCES DISTILLED FROM COAL TAR

From the evil-smelling, thick, black liquid known as coal tar the chemist obtains, by distillation, more than 200 different substances. Some of the more familiar compounds, each of which has many uses, are: benzene, a solvent; toluene, best known to us when converted to the explosive T.N.T.; naphthalene, a familiar moth repellent; phenol, or carbolic acid, an antiseptic; cresols, used in creosote for preserving timber; and xylene, anthracene, and phenanthrene.

DDT INSECTICIDES, ANTU RODENTICIDE, AND 2,4-D WEED KILLERS AMONG COAL-TAR PRODUCTS OF INTEREST TO FARMERS

The farmer's growing array of chemical products for the control of various pests owes much to coal and coal tar, from which such powerful agricultural chemicals as DDT insecticides, 2,4-D weed killers, and Antu rat poison are derived.

And the farmer and his family are equally beholden to coal tar for the brilliant and durable dyes in their clothing: mildew inhibitors; water-repellent textile finishes; perfumes; pharmaceuticals and drugs such as sulfanilamide, aspirin, atabrine, saccharine; and a number of antiseptics, anaesthetics, and a host of other everyday products.

These and other interesting facts are included in a new illustrated educational booklet, "Coal Tar and the Chemist," recently published by Du Pont. This booklet, like the one on "The Story of Cellulose" reviewed in the May-June issue of the "Agricultural News Letter," was written primarily for students, although the material is also suitable for general reading.

DDT Insecticides

The booklet points out that coal tar is an ingredient "that indirectly finds its way into the potent insecticide DDT." It explains it in this way:

"Chlorine can be combined with benzene, obtained from coal-tar distillation, to form chlorobenzene. When this compound is treated under the proper

Continued on next page

conditions with chloral, popularly known as 'knockout drops', the product is DDT. The DDT is then mixed with other ingredients to form insecticides."

It says the greatest use of DDT in this country today is for agricultural purposes.

"DDT compositions are being used to kill insect pests on sheep, cattle, goats, and hogs. Many types of fruits and vegetables are being produced in higher quantities and quality because of the protection given them by this insecticide."

Methoxychlor Insecticide

Then there is methoxychlor, a chemical relative of DDT, which Du Pont is now offering under the trade-mark of "Marlate" insecticide. The booklet says that "for killing certain insects it is even more effective" than DDT.

"In addition," the booklet adds, "it is safer on those plants subject to injury from DDT, and is far less toxic to warm-blooded animals. Like DDT, methoxychlor has a residual effect, but it has the added advantage of a rapid knockdown on insects such as flies and mosquitoes."

2,4-D Weed Killers

The annual cost of weeds is estimated at more than three billion dollars, the booklet says. However, with the introduction of chemical weed killers, "another chapter is being written in the control of weeds on farms and in millions of acres of turf area."

It adds that 2,4-D is a weed killer with unusual properties.

"This chemical, related to coal tar through its phenyl group, behaves like the renowned Dr. Jekyll and Mr. Hyde," it says. "Under certain circumstances, it acts as a plant-growth promoter, and when so used it is called a plant hormone. This and other products which act similarly have been used in diluted form to stimulate the growth of various plants, such as pineapples.

"But, like certain medicines that are poisonous in over-doses, these hormone-like materials, administered in concentrated forms, are selective weed killers. Properly used on pastures, lawns and other turf areas, 2,4-D does away with undesirable weeds without materially affecting the grasses."

Antu Rodenticide

Antu, known to the chemist as alpha-naphthylthiourea, was prepared in 1925 in a laboratory of an American chemical company as part of a research program on dyes. It filled no need in this field at the time, and so joined the many other organic chemicals on the storage shelves of the laboratory. Today it is on the market as a rodenticide.

Continued on next page

"Antu is a highly potent, tasteless rat poison used for the control of the brown rat, the principal disease-carrying rat in the United States," the booklet says.

Aerosol Bombs Contain "Freon" and Insecticide

A number of "Freon" fluorinated hydrocarbon refrigerants are derived from ethylene, a gas that can be obtained from coal, natural gas, or petroleum. Certain types of these refrigerants, together with an insecticide, can be put into a special container known as an aerosol bomb. When the bomb is opened, the "Freon" evaporates very rapidly and acts as a propellent, spraying the insecticide into the air.

Dyes

Considerable space is devoted to man-made dyes. In this connection, the booklet says: "Today the color-consuming industries have at their disposal an annual production of over 120,000,000 pounds of coal-tar colors, consisting of more than a thousand different dyes from which to choose. It is possible to produce any desired shade on almost any textile fiber with a high degree of fastness by using these synthetic dyes. Not only are royalty no longer the sole owners of colored garments, but the cost of dyes has dropped so sharply that the average American now pays only about 50 cents a year for the synthetic colors that brighten his surroundings."

Numerous Other Products

In addition, numerous other products are discussed. These include petroleum chemicals such as antioxidants, metal deactivators, and an antiknock compound; styrene for GR-S rubber, and various chemicals for improving rubber products; synthetic resins for finishes; and textile chemicals.

NOTE: Copy of booklet "Coal Tar and the Chemist" will be sent on request. Address, Editor, Du Pont "Agricultural News Letter," Wilmington 98, Del.

########

MOTION PICTURES AVAILABLE ON LOAN

The Du Pont Company is glad to lend 16mm. sound prints of motion pictures to clubs and other organizations having a 16 mm. sound projector. The subjects covered range from a number of specific interest to the farmer to yarns and fabrics made of rayon. For full information, merely send a postal card to Agricultural News Letter, E. I. du Pont de Nemours & Company, Wilmington 98, Delaware.

########

FOOT ROT USUALLY CAUSED BY INFECTION OF BRUISE

"Foot rot in dairy cattle is difficult to treat because it may be caused by a variety of conditions so that measures that are effective against one type of trouble have no effect on other cases showing the same degree of lameness. Usually foot rot is due to a bruise. This is followed by infection with Actinomyces necrophorus, the filth bacillus.

"Prevention is the best method of attack. For most herds this means improved barnyard construction. By leveling off the entire area and by removing stones, sticks, and other objects that can bruise the feet; and at the same operation filling up the low places where water can collect to form mud which will harbor the foot-rot-causing infection, both contributing causes to this condition will be controlled...

"When these precautions have not been taken or when foot rot appears in spite of these precautions, then treatment is necessary." -- "Hoard's Dairyman."

VARIOUS METHODS OF TREATING FOOT ROT DISCUSSED BY DAIRY JOURNAL

One of the simpler treatments to cure foot rot of dairy cattle is to clean the affected foot with a brush and warm water to remove all filth and dead tissue, and then let it stand for five minutes in a solution of one ounce of copper sulfate crystals in one pint of water.

"Then apply a bandage, and soak it in a solution containing 5 per cent phenol (carbolic acid) and 3 per cent formalin in water," according to "Hoard's Dairyman." The bandaged animal should be confined to a clean, dry stall.

Another simple treatment consists of cleaning the foot, dusting in some completely air-slacked lime, applying a bandage, and putting the animal in a clean stall.

Among additional and more complicated treatments mentioned are sulfa drugs, penicillin, and the so-called non-specific protein treatment. Reports on results vary greatly. Sulfa and penicillin injections should be reserved for those cases that fail to respond to the older and simpler methods, the article says.

########